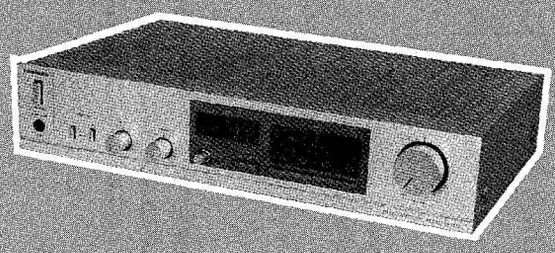
SERVICE DATA
FILE NO. 170-173

TOSHIBA

STEREO AMPLIFIER

SB-M20



SPECIFICATIONS

■ General

Power supply:	220V – 50 Hz (TE) 240V – 50 Hz (TU, AY) 110 – 127/220 – 240V, 50/60 Hz (VF)
Power consumption:	250W (TE, TU, AY) 80W (VF)
Weight:	4.9 kg
Dimensions:	420(W) x 89(H) x 279(D)mm

■ Amplifier

Continuous power output 60 Hz ~ 12.5 kHz both ch. driven:	40W x 2 (4Ω, 0.7% THD IEC) (TE, TU, AY)
1 kHz both ch. driven:	45W x 2 (4Ω, 0.09% THD) (VF)
Total harmonic distortion:	0.03% (at ½ rated power 8Ω, 1 kHz)
Frequency response:	10 Hz ~ 100 kHz ($^{+0}_{-3}$ dB) 30 Hz ~ 20 kHz ±0.5 dB (RIAA eq.)
Power band width (IHF):	10 Hz ~ 75 kHz
Load impedance:	4Ω ~ 16Ω
S/N (IHF A Network):	100 dB (TUNER/AUX) 73 dB (PHONO)
Input sensitivity/ impedance:	PHONO 2.5 mV/47 kΩ TUNER 150 mV/27 kΩ AUX/TAPE 150 mV/27 kΩ
Output level:	TAPE REC 150 mV/3.3 kΩ
Tone control:	BASS (at 100 Hz) ±9 dB TREBLE (at 10 kHz) ±9 dB
Phono overload level:	150 mV (RMS/0.05% THD)

Specifications are subject to change without notice.

TE, TU, AY, VF
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1. SYSTEM CONNECTIONS

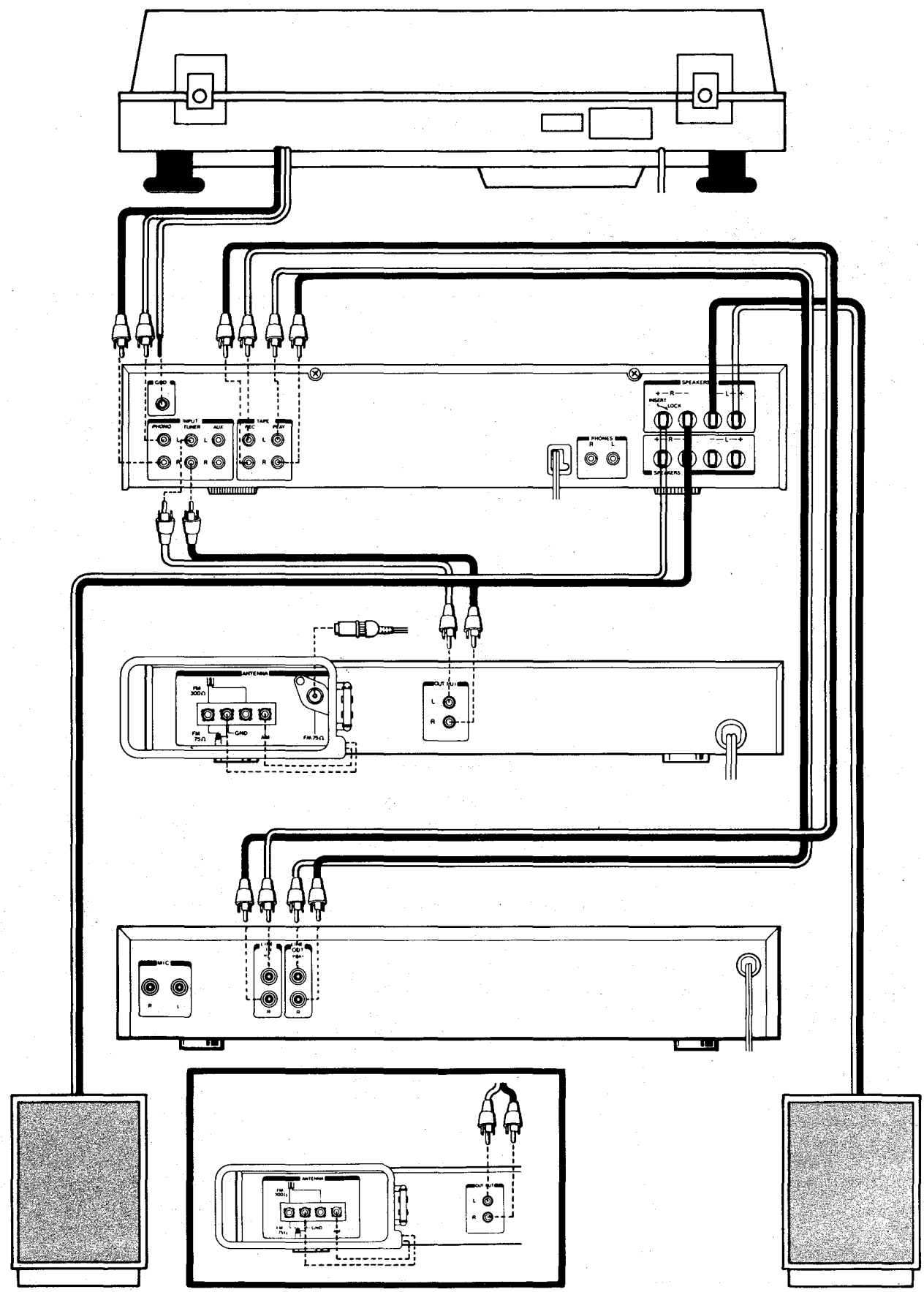


Figure 1

2. OPERATING CONTROLS

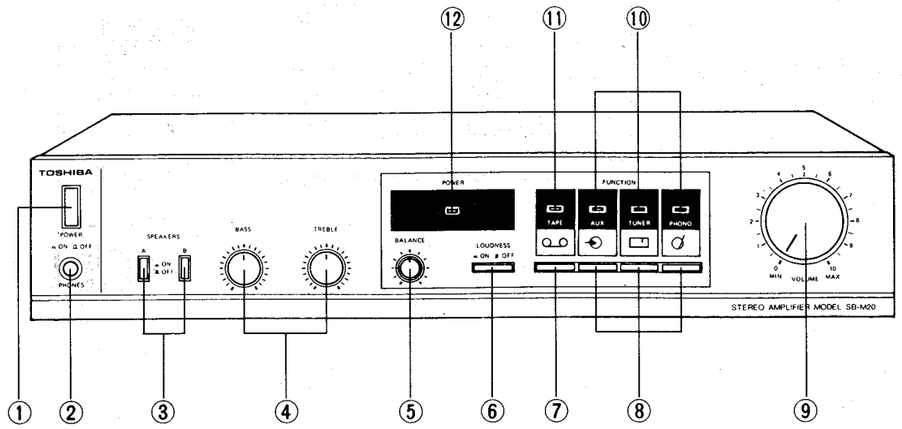


Figure 2

① **Power switch**
Depress this switch to turn the power on, depress again to turn the power off.

② **Phones**
Plug into this jack when listening through headphones.

③ **Speaker selector**
Speakers A and B can be operated independently. Relation of speaker switches to sound output.

Switch A / Switch B	ON	OFF
ON	Speakers A, B	Speaker B
OFF	Speaker A	No sound

Note: When either speaker A or B is connected to the amplifier, sound from the speaker will be cut off it both switches A and B are depressed.

④ **Bass and treble controls**
Turn these knobs clockwise from the centre zero (flat) position to emphasize bass or treble. Turn counter-clockwise to attenuate (decrease) bass or treble.

⑤ **Balance control**
Turn this knob to adjust volume balance between left and right speakers.

⑥ **Loudness switch**
Depress this switch for listening at very low volume levels. The loudness circuit emphasizes the low and high frequency regions for a natural tonal balance at low volume levels. (This switch is effective between zero and the midpoint position of the volume knob.)

⑦ **Tape monitor switch**
This switch is used for playback or recording with a tape deck. The programme source selected with the FUNCTION selectors ⑧ can be heard by setting this switch to the OFF position. With the switch in the ON position, playback from a tape deck connected to the TAPE terminals can be monitord.

⑧ **Funciton selectors**
Choose the desired programme source by pressing one of these buttons:
PHONO: For a turntable
TUNER: For a tuner
AUX: For any kind of audio equipment (excluding turntables and microphones)

⑨ **Volume**
Turn this knob to adjust the volume level.

⑩ **Function indicators**

⑪ **Tape monitor indicator**

⑫ **Power indicator**

3. DISASSEMBLY INSTRUCTIONS

TOP COVER REMOVAL
1. Remove six screws Ⓐ (3ϕ x 6mm), Ⓑ (3ϕ x 6mm) and Ⓒ (3ϕ x 6mm), and the top cover can be removed from the unit. (See Figure 3, 4 and 5)

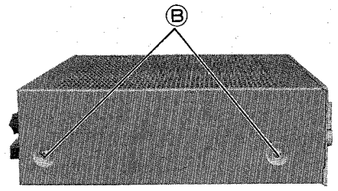


Figure 4

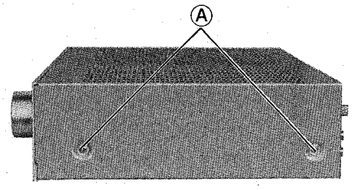


Figure 3

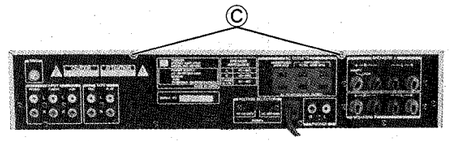


Figure 5

FRONT PANEL REMOVAL
1. Remove the top corer. (See Figure 3, 4 and 5)
2. Remove seven screw Ⓓ (3ϕ x 8mm) and Ⓔ (3ϕ x 8mm), and the front panel can be removed from the unit. (See Figure 6 and 7)

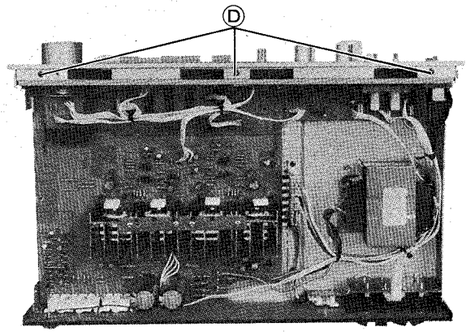


Figure 6

Figure 7

P.C. BOARD REMOVAL
1. Remove six screws Ⓕ (3ϕ x 6mm), Ⓖ (3ϕ x 8mm) and nut Ⓙ. (See Figure 8)
2. Remove nine screws Ⓗ (3ϕ x 8mm), Ⓘ (3ϕ x 8mm) and the jack plate, then the P.C. Board can be removed from the unit. (See Figure 8, 9 and 10)

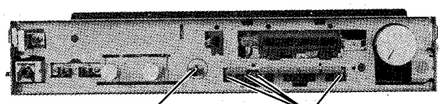


Figure 8

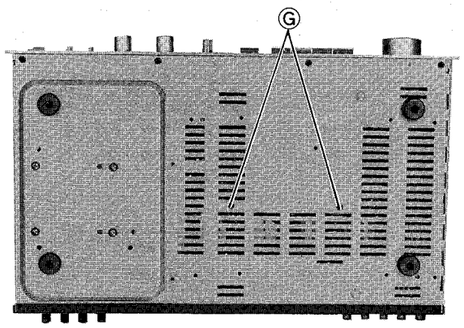


Figure 9

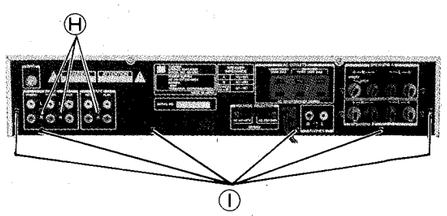
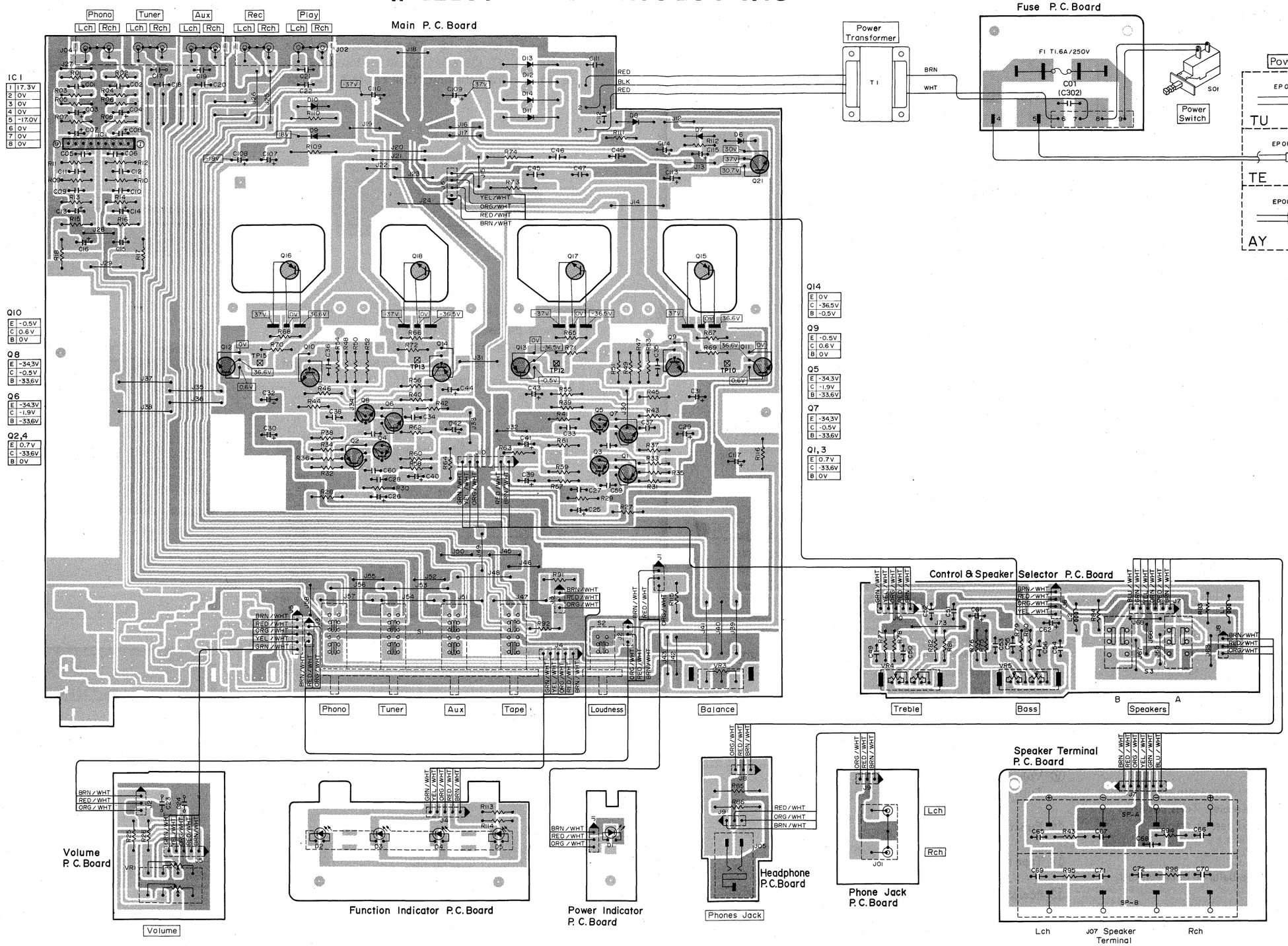


Figure 10

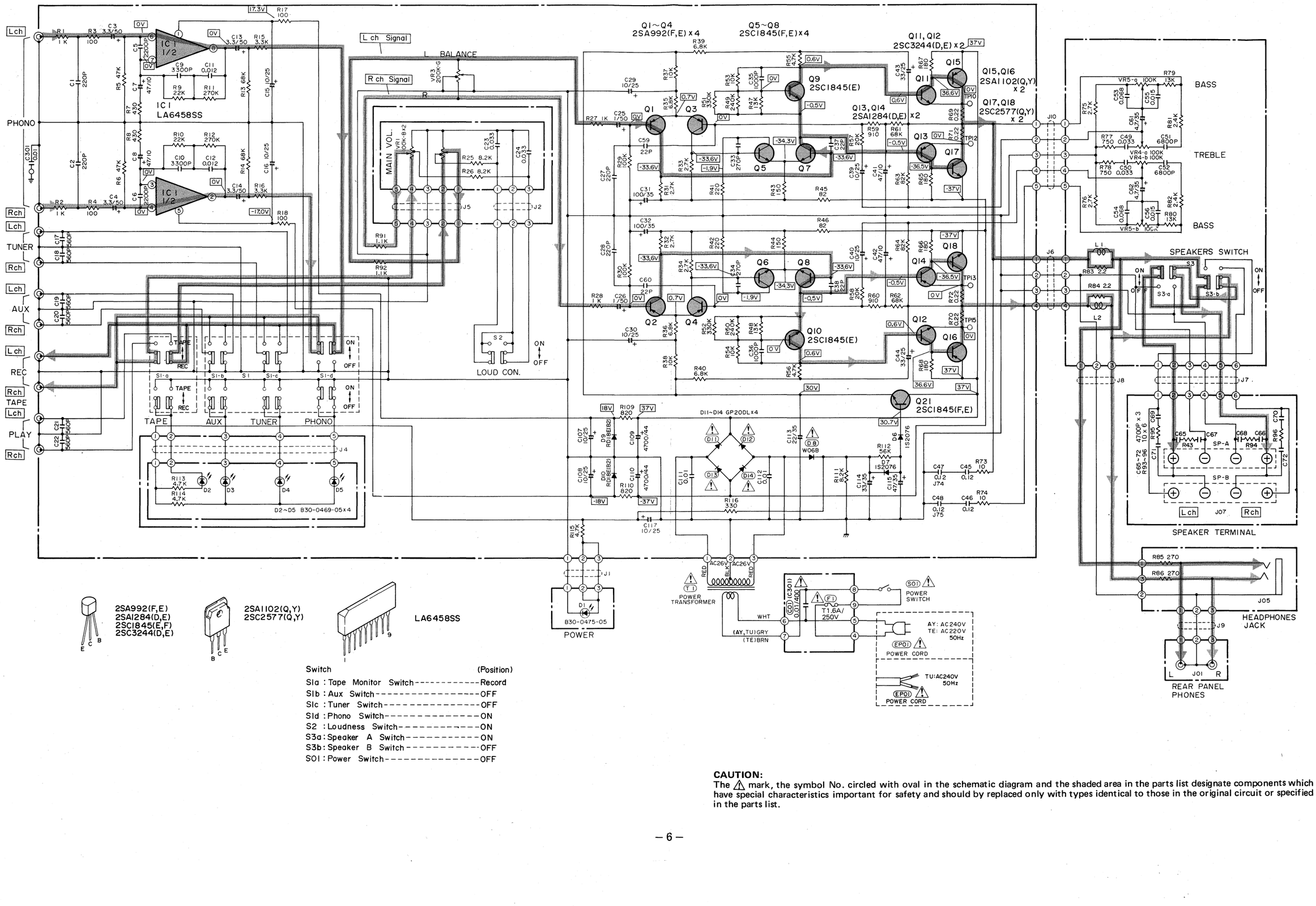
(TE, TU, AY MODEL)

4. ELECTRICAL PARTS LOCATIONS



(TE, TU, AY MODEL)

5. SCHEMATIC DIAGRAM



2SA992(F,E)
2SA1284(D,E)
2SC1845(E,F)
2SC3244(D,E)

2SA1102(Q,Y)
2SC2577(Q,Y)

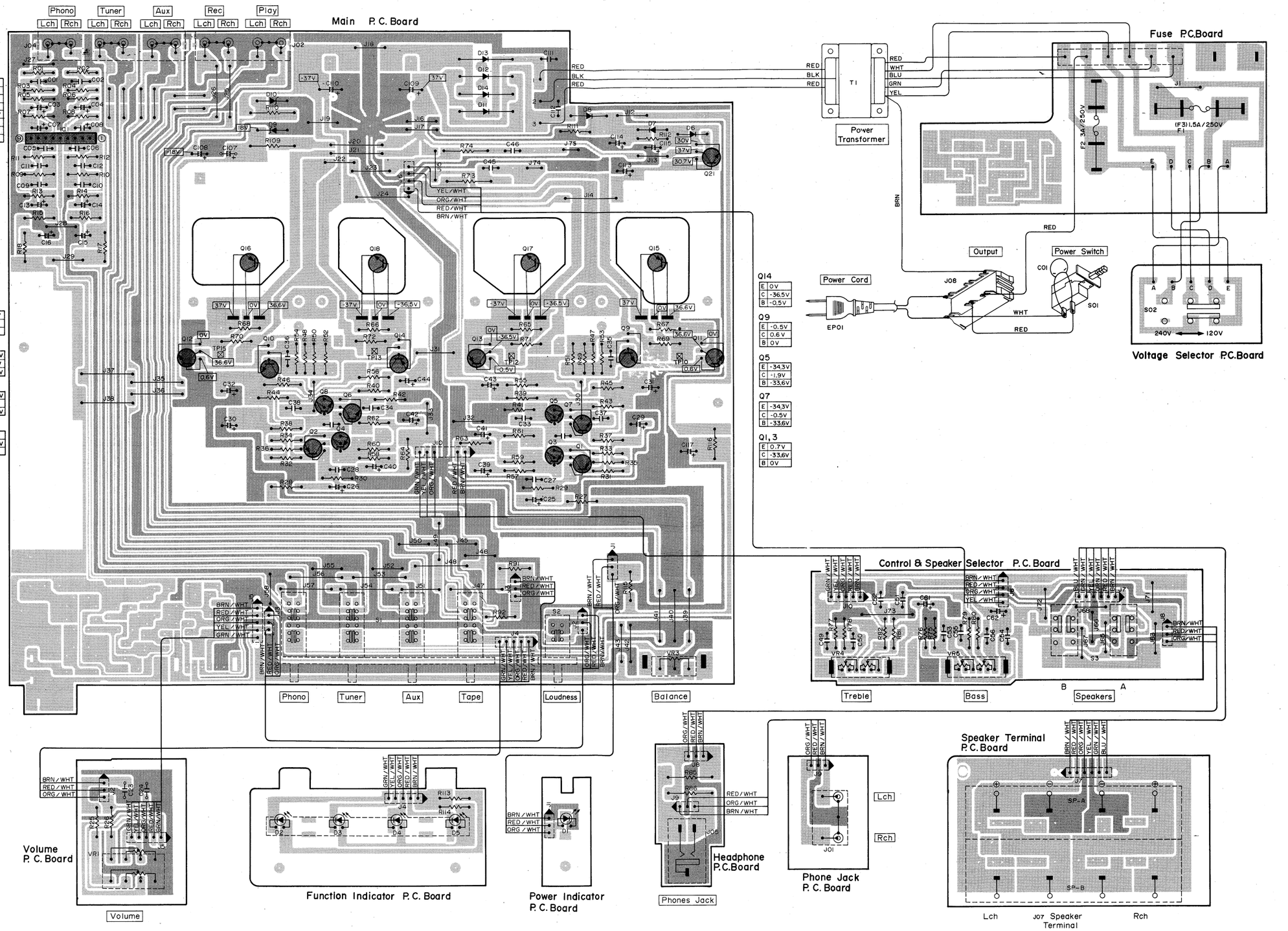
LA6458SS

Switch	(Position)
S1a : Tape Monitor Switch	Record
S1b : Aux Switch	OFF
S1c : Tuner Switch	OFF
S1d : Phono Switch	ON
S2 : Loudness Switch	ON
S3a : Speaker A Switch	ON
S3b : Speaker B Switch	OFF
S01 : Power Switch	OFF

CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should by replaced only with types identical to those in the original circuit or specified in the parts list.

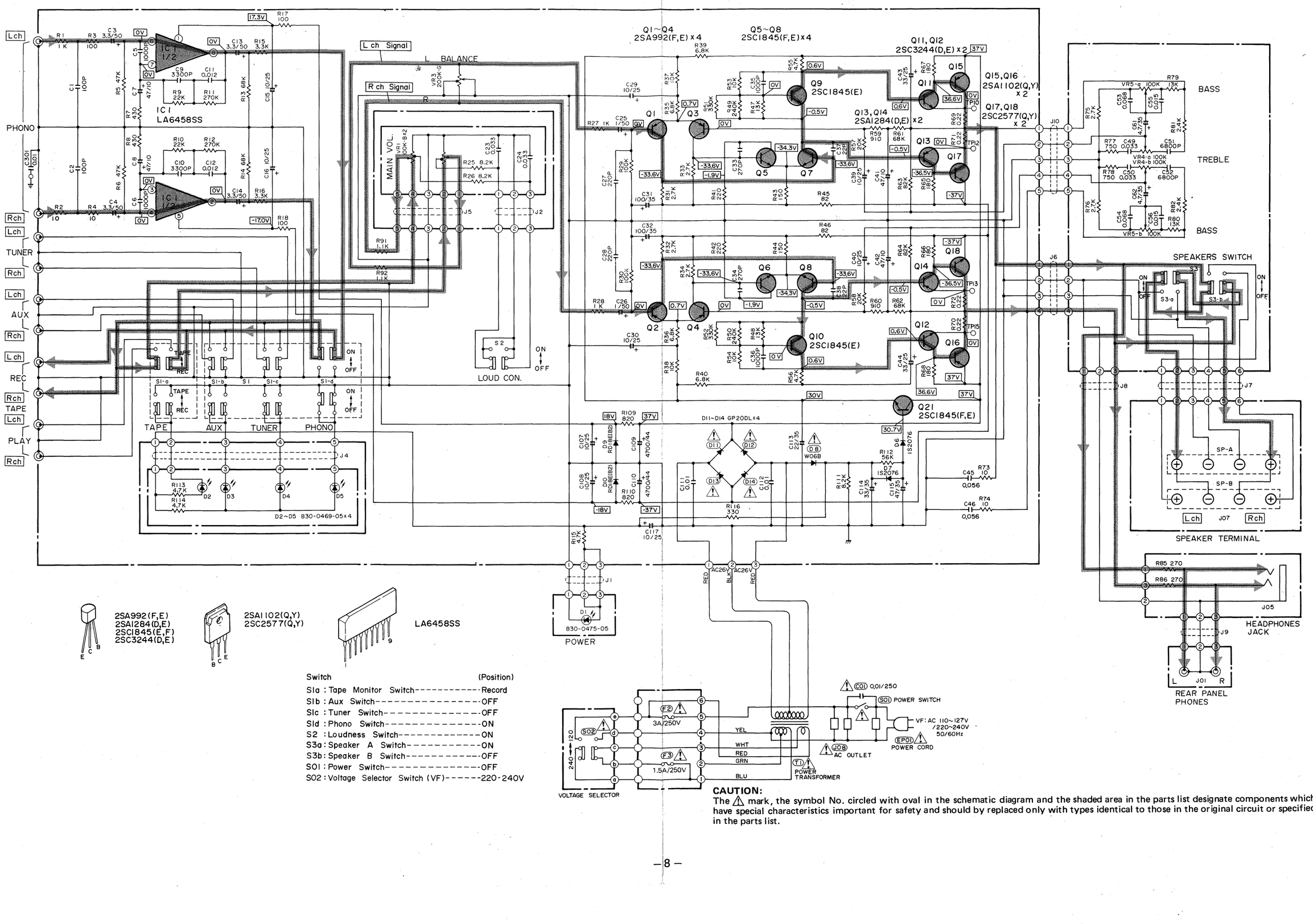
(VF MODEL)

6. ELECTRICAL PARTS LOCATIONS



(VF MODEL)

7. SCHEMATIC DIAGRAM



2SA992(F,E)
2SA1284(D,E)
2SC1845(E,F)
2SC3244(D,E)

2SA1102(Q,Y)
2SC2577(Q,Y)

LA6458SS

Switch	(Position)
S1a : Tape Monitor Switch	Record
S1b : Aux Switch	OFF
S1c : Tuner Switch	OFF
S1d : Phono Switch	ON
S2 : Loudness Switch	ON
S3a : Speaker A Switch	ON
S3b : Speaker B Switch	OFF
S01 : Power Switch	OFF
S02 : Voltage Selector Switch (VF)	220-240V

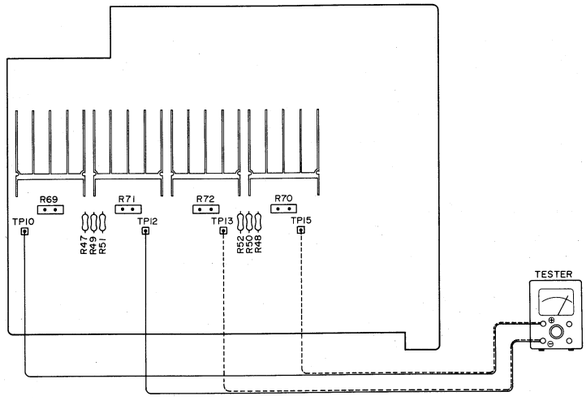
CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should by replaced only with types identical to those in the original circuit or specified in the parts list.

8. IDLE CURRENT ADJUSTMENTS

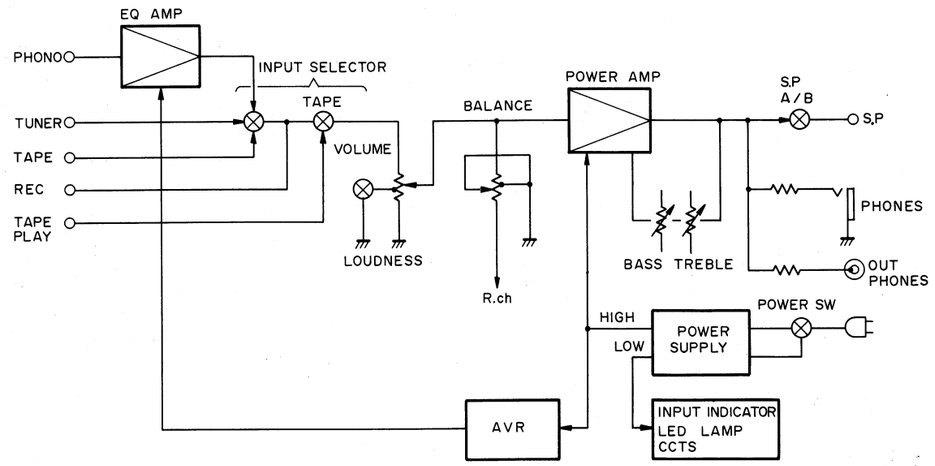
(Left Channel)
Adjust the equivalent resistance value of R47, R49 and R51 so that idle current is 50mA (voltage 22mV) between TP10 and TP12 of TEST POINTS.

(Right Channel)
Adjust the equivalent resistnace value of R48, R50 and R52 so that idle currnet is 50mA (voltage 22mV) between TP13 and TP15 of TEST POINTS.

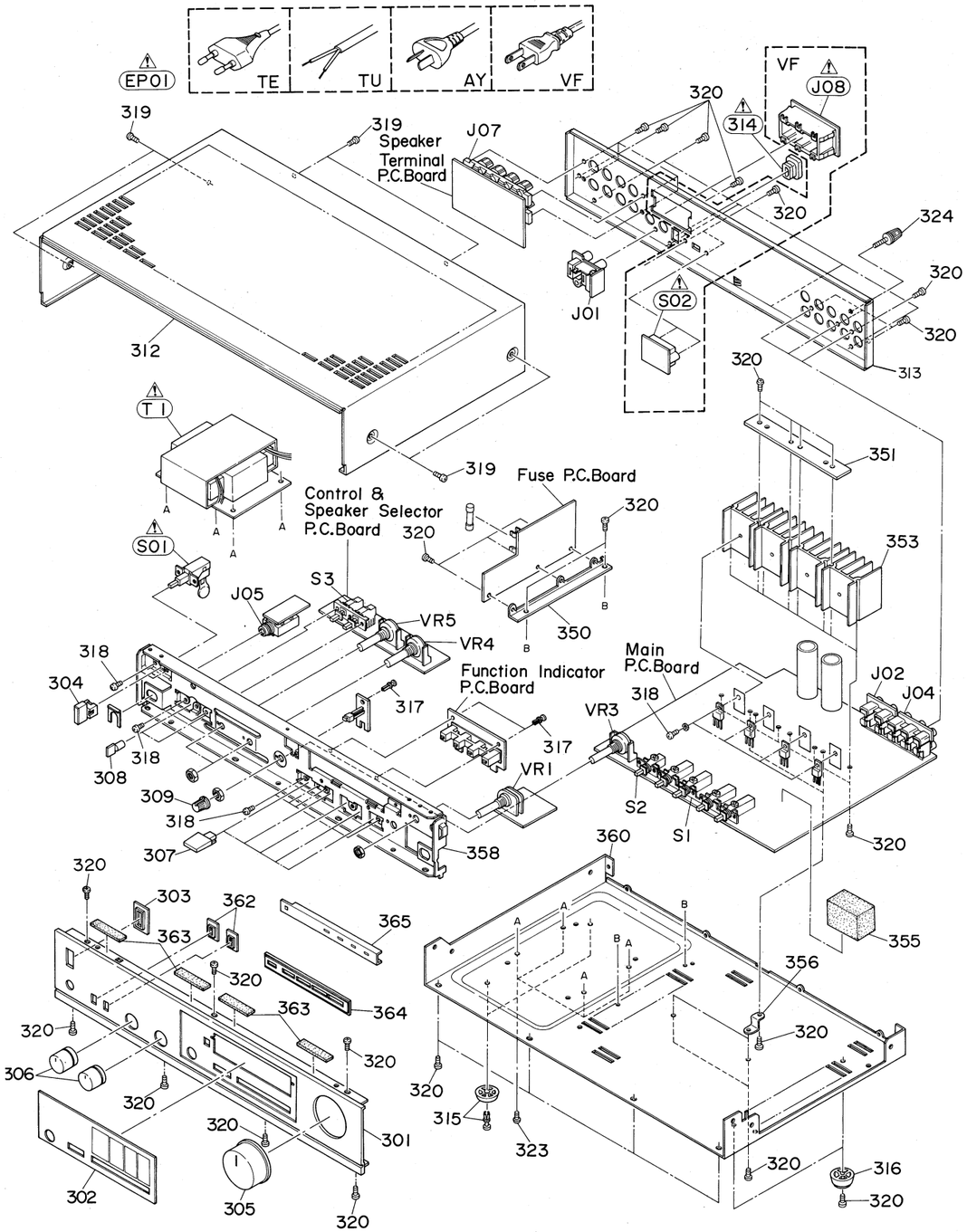
As you adjust equivalent resistance value smaller, idle current will increase, and as you adjust equivalent resistnace value bigger, idle current will decrease.



9. BLOCK DIAGRAM



10. EXPLODED VIEW CABINET



NOTE: Parts excluded in the parts list are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

11. (CABINET) PARTS LIST

CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should by replaced only with types identical to those in the original circuit or specified in the parts list.

Symbol No.	Part No.	Description
301	22825238	Panel Ass'y
302	22838193	Decoration Plate
303	22883067	Escutcheon
304	22824460	Knob Ass'y, Power
305	22826413	Knob, Main Volume
306	22826414	Knob, Treble/Bass
307	22884321	Knob, Tape/AUX/Tuner/-Phono/Loudness
308	22884322	Knob, Speaker
309	22826415	Knob, Balance
312	22841391	Top Cover
313	22841348	Jack Plate (TE)
313	22841349	Jack Plate (TU, AY)
313	22841350	Jack Plate (VF)
⚠ 314	25848041	Cord Bush
315	22828090	Foot, Left
316	22828091	Foot, Right
317	22705026	Plastic Rivet, 3ϕ x 6mm
318	22707066	Screw, 3ϕ x 6mm, BID
319	22707490	Screw, 3ϕ x 6mm, BID Tapping
320	22707911	Screw, 3ϕ x 8mm, BID Tapping
323	22707269	Screw, 4ϕ x 10mm, BID Tapping
324	22708058	Screw, Ground

Symbol No.	Part No.	Description

12. PARTS LIST

CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should by replaced only with types identical to those in the original circuit or specified in the parts list.

Symbol No.	Part No.	Description
		IC'S, TRANSISTORS & DIODES
IC1	22117271	IC, LA6458SS
Q1, 2 3, 4	22117256	Transistor, 2SA992-F/E
Q5, 6 7, 8 21	22117262	Transistor, 2SC1845-F/E
Q9, 10	22117284	Transistor, 2SC1845-E
Q11, 12	22117321	Transistor, 2SC3244-D/E
Q13, 14	22117320	Transistor, 2SA1284-D/E
Q15, 16	22117257	Transistor, 2SA1102-O/Y
Q17, 18	22117265	Transistor, 2SC2577-O/Y
D1	22115879	Diode, SLP-153B-40, LED
D2, 3 4, 5	22115891	Diode, SLP-162B, LED
D6, 7	22115882	Diode, 1S2076A
D8	22115894	Diode, W06B
D9, 10	22115539	Diode, RD18E-B2
⚠ D11, 12 13, 14	22115886	Diode, GP20DL
		ELECTRICAL PARTS
L1, 2	22210188	Coil (TE, TU)
⚠ T1	22224266	Transformer, Power (TE)
⚠ T1	22224267	Transformer, Power (TU)
⚠ T1	22224268	Transformer, Power (AY)
⚠ T1	22224269	Transformer, Power (VF)
S1	22196331	Push Switch, Function TAPE/AUX/TUNER/PHONO
S2	22196332	Push Switch, Loudness
S3	22196333	Push Switch, Speaker A/B
⚠ S01	22196360	Push Switch, Power
⚠ S02	22196336	Slide Switch, Voltage (VF)
J01	22198051	Jack, 2P, Phones
J02	22198061	Jack, 4P, Tape
J04	22198054	Jack, 6P, Input
J05	22198056	Jack, Headphone, 6ϕ
J07	22162522	Terminal, 8P, Speaker

Symbol No.	Part No.	Description
⚠ J08	22169040	AC Outlet (VF)
⚠ F1	22144474	Fuse, T1.6A, 250V (TE, TU, AY)
⚠ F2	22144476	Fuse, 3A, 250V (VF)
F3 (F1)	22144475	Fuse, 1.5A, 250V (VF)
⚠ EP01	22176286	Power Cord (TE)
⚠ EP01	22176628	Power Cord (TU)
⚠ EP01	22176588	Power Cord (AY)
⚠ EP01	22176125	Power Cord (VF)
EP02	22165036	Fuse Holder (TE, TU, AY)
EP03	22165093	Fuse Holder (VF)

CAPACITORS

D = ±0.5pF, J = ±5%, K = ±10%, M = ±20%,
Z = −20 + 80% , P = − 0 + 100%
ABBREVIATIONS: CD=Ceramic Disk, EL=Electrolytic, MY = Mylar, PP = Polypropylene,

⚠ C01 (C302)	22340147	CD, 0.01mfd, 400V, P (TE, TU, AY)
⚠ C01	22340172	CD, 0.01mfd, 250V, Z (VF)
C1, 2	22362221	CD, 220pF, 50V, J (TE, TU, AY)
C1, 2	22362101	CD, 100pF, 50V, J (VF)
C3, 4	223488339	EL, 3.3mfd, 50V
C5, 6	22362101	CD, 100pF, 50V, J (TE, TU, AY)
C5, 6	22349222	CD, 2200pF, 50V, K (VF)
C7, 8	22483470	EL, 47mfd, 10V
C9, 10	22372332	MY, 3300pF, 50V, K
C11, 12	22371123	MY, 0.012mfd, 50V, J
C13, 14	22488339	EL, 3.3mfd, 50V
C15, 16	22446100	EL, 10mfd, 25V
C17, 18	22349561	CD, 560pF, 50V, K (TE, TU, AY)
C19, 20	22349561	CD, 560pF, 50V, K
C21, 22	22349561	CD, 560pF, 50V, K
C23, 24	22371333	MY, 0.033mfd, 50V, J
C25, 26	22488109	EL, 1mfd, 50V
C27, 28	22362221	CD, 220pF, 50V, J
C29, 30	22488100	EL, 10mfd, 50V
C31, 32	22487101	EL, 100mfd, 35V
C33, 34	22362271	CD, 270pF, 50V, J
C35, 36	22349102	CD, 1000pF, 50V, K

Symbol No.	Part No.	Description
C37, 38	22361220	CD, 22pF, 50V, J
C39, 40	22446100	EL, 10mfd, 25V
C41, 42	22483470	EL, 47mfd, 10V
C43, 44	22486330	EL, 33mfd, 25V
C45, 46	22371154	MY, 0.12mfd, 50V, J (TE, TU, AY)
C45, 46	22371563	MY, 0.056mfd, 50V, J (VF)
C47, 48	22371154	MY, 0.12mfd, 50V, J (TE, TU, AY)
C49, 50	22371333	MY, 0.033mfd, 50V, J
C51, 52	22371682	MY, 6800pF, 50V, J
C53, 54	22371683	MY, 0.068mfd, 50V, J
C55, 56	22371153	MY, 0.015mfd, 50V, J
C59, 60	22361220	CD,22pF,50V, J (TE, TU,AY)
C61, 62	22447479	EL, 4.7mfd, 35V
C65, 66	22349152	CD, 1500pF, 50V, K (TE, TU, AY)
C67, 68	22349152	CD, 1500pF, 50V, K
C69, 70	22349152	CD, 1500pF, 50V, K
C71, 72	22349152	CD, 1500pF, 50V, K
C107, 108	22485100	EL, 10mfd, 25V
⚠ C109, 110	22440644	EL, 4700mfd, 44V
C111, 112	22342103	CD, 0.01mfd, 50V, K
C113	22447220	EL, 22mfd, 35V
C114	22487330	EL, 33mfd, 35V
C115	22447470	EL, 47mfd, 35V
C117	22446100	EL, 10mfd, 25V
C301	22342103	CD, 0.01mfd, 50V, Z

RESISTORS

All resistors are carbon film, ¼W, ±5% unless otherwise noted. 1K ohm = 1000 ohm

R1, 2	22545102	1K ohm (TE, TU)
R1, 2	22545100	10 ohm (AY, VF)
R3, 4	22545101	100 ohm (TE, TU)
R3, 4	22545100	10 ohm (AY, VF)
R5, 6	22545473	47K ohm
R7, 8	22545471	430 ohm
R9, 10	22545223	22K ohm
R11, 12	22545274	270K ohm
R13, 14	22545683	68K ohm
R15, 16	22545332	3.3K ohm
R17, 18	22545101	100 ohm
R25, 26	22545822	8.2K ohm
R27, 28	22545102	1K ohm
R29, 30	22545104	100K ohm
R31, 32	22545272	2.7K ohm
R33, 34	22545272	2.7K ohm
R35, 36	22545682	6.8K ohm
R37, 38	22545103	10K ohm
R39, 40	22545682	6.8K ohm
R41, 42	22545221	220 ohm
R43, 44	22545151	150 ohm
R45, 46	22545820	82 ohm
R47, 48	22545123	13K ohm
R49, 50	22545224	240K ohm
R51, 52	22545334	330K ohm
R53, 54	22545103	10K ohm
R55, 56	22545472	4.7K ohm
R57, 58	22545223	20K ohm
R59, 60	22540638	910 ohm
R61, 62	22545683	68K ohm
R63, 64	22545823	82K ohm
R65, 66	22545181	180 ohm
R67, 68	22545181	180 ohm
R69, 70	22570596	0.22 ohm, 5W, Wire Wound
R71, 72	22570596	0.22 ohm, 5W, Wire Wound
R73, 74	22570250	10 ohm, 1W, Metal Oxide Film
R75, 76	22545272	2.7K ohm
R77, 78	22550151	750 ohm
R79, 80	22545123	13K ohm
R81, 82	22545242	2.4K ohm
R83, 84	22545222	2.2K ohm (TE, TU, AY)
R85, 86	22570260	270 ohm, 1W, Metal Oxide Film
R91, 92	22545102	1.1K ohm
R93, 94	22545330	33 ohm (TE, TU, AY)
R95, 96	22545330	33 ohm (TE, TU, AY)
R109, 110	22570273	820 ohm, 1W, Metal Oxide Film
R111	22545822	8.2K ohm
R112	22545563	56K ohm
R113, 114	22545472	4.7K ohm
R115	22545472	4.7K ohm
R116	22545331	330 ohm
VR1	22651590	100K ohm x 2, Variable, Volume
VR3	22657296	200K ohm, Variable, Balance
VR4	22657297	100K ohm, Variable, Treble
VR5	22657297	100K ohm, Variable, Bass

ACCESSORIES

AC01	22903769	Owner's Manual (TE)
AC01	22903770	Owner's Manual (TU, AY)
AC01	22903771	Owner's Manual (VF)
AC02	22164300	Adapter, AC Plug (VF)